

## CLAIMS

1. An apparatus for a communication system, comprising:

a decover element for decoving a plurality of received samples to provide recovered half-symbols, wherein the decover element is configured to perform decoving with a decoving channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples; and

a first multiplier for receiving the recovered half-symbols and pilot symbols to provide demodulated half-symbols.

2. The apparatus of claim 1, wherein the received samples are despread received samples, further comprising:

a second multiplier for producing the despread received samples.

3. The apparatus of claim 1, further comprising:

a combiner for combining the demodulated half-symbols received from the first multiplier.

4. The apparatus of claim 3, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols corresponding to a first half of a symbol period; and

a second accumulator for accumulating the demodulated half-symbols corresponding to a second half of the symbol period.

5. The apparatus of claim 1, further comprising:

a switch for selectively outputting the demodulated half-symbols corresponding to a first half of the symbol period and the demodulated half-symbols corresponding to a second half of the symbol period.

6. An apparatus for a communication system, comprising:

a first and second correlator, each correlator including

a decover element for decoving a plurality of received samples to provide recovered half-symbols, wherein the decover element is configured to

perform decoupling with a decoupling channelization symbol having a length (T) that is half the length (2T) of a coupling channelization symbol used to cover the received samples;

a first multiplier for receiving the decoupled half-symbols and pilot symbols to provide demodulated half-symbols; and

a switch for selectively sending a demodulated half-symbol along a first signal path during a first half of a symbol period and an inverted demodulated half-symbol along a second signal path during a second half of the symbol period.

7. The apparatus of claim 6, wherein the received samples are despreading samples, and further comprising:

a second multiplier for producing the despreading received samples.

8. The apparatus of claim 6, further comprising:

a conjugator for conjugating the demodulated half-symbols along the second signal path.

9. The apparatus of claim 6, further comprising:

a combiner for combining the demodulated half-symbols received from the first and second signal paths of the respective first and second correlators.

10. The apparatus of claim 9, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols along the first signal path of the first correlator and the second signal path of the second correlator; and

a second accumulator for accumulating the demodulated half-symbols along the second signal path of the first correlator and the first signal path of the second correlator.

11. An apparatus for a communication system, comprising:

a first and second correlator, each correlator including

a decoupling element for decoupling a plurality of received samples to provide decoupled half-symbols, wherein the decoupling element is configured to perform decoupling with a decoupling channelization symbol having a length

(T) that is half the length (2T) of a covering channelization symbol used to cover the received samples;

a switch for selectively outputting the recovered half-symbols corresponding to a first half of a symbol period along a first signal path and recovered half-symbols corresponding to a second half of the symbol period along a second signal path;

first and second summers, respectively coupled to the first and second signal paths, for combining each pair of recovered half-symbols to provide a respective recovered symbol; and

first and second multipliers for receiving the recovered symbols and pilot symbols to provide demodulated symbols.

12. The apparatus of claim 11, wherein the received samples are despread received samples, said first and second correlator further including:

a third multiplier for producing the despread received samples.

13. The apparatus of claim 11, further comprising:

a conjugator for conjugating the recovered symbols along the second signal path of the first correlator and the first signal path of the second correlator.

14. The apparatus of claim 11, further comprising:

a delay element for delaying the recovered half-symbols along the first signal path.

15. The apparatus of claim 11, further comprising:

a combiner for combining the demodulated symbols received from the first and second correlators.

16. The apparatus of claim 15, wherein the combiner comprises:

a first accumulator for accumulating the demodulated symbols from the first multiplier of the first and second correlators; and

a second accumulator for accumulating the demodulated symbols from the second multiplier of the first and second correlators.

17. A communication system, comprising:  
a transmitter; and  
a receiver for processing a received signal transmitted from the transmitter, said receiver including:

a decover element for decoving a plurality of received samples to provide recovered half-symbols, wherein the decover element is configured to perform decoving with a decoving channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples; and

a first multiplier for receiving the recovered half-symbols and pilot symbols to provide demodulated half-symbols.

18. The communication system of claim 17, wherein the received samples are despread received samples, further comprising:

a second multiplier for producing the despread received samples.

19. The communication system of claim 17, further comprising:

a combiner for combining the demodulated half-symbols received from the first multiplier.

20. The communication system of claim 19, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols corresponding to a first half of a symbol period; and

a second accumulator for accumulating the demodulated half-symbols corresponding to a second half of the symbol period.

21. The communication system of claim 17, further comprising:

a switch for selectively outputting the demodulated half-symbols corresponding to a first half of the symbol period and the demodulated half-symbols corresponding to a second half of the symbol period.

22. A communication system, comprising:

a transmitter; and

a receiver for processing a received signal transmitted from the transmitter, said receiver including:

a first and second correlator, each correlator including

a decover element for decoving a plurality of received samples to provide recovered half-symbols, wherein the decover element is configured to perform decoving with a decoving channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples;

a first multiplier for receiving the recovered half-symbols and pilot symbols to provide demodulated half-symbols; and

a switch for selectively sending a demodulated half-symbol along a first signal path during a first half of a symbol period and an inverted demodulated half-symbol along a second signal path during a second half of the symbol period.

23. The communication system of claim 22, wherein the received samples are despread samples, and further comprising:

a second multiplier for producing the despread received samples.

24. The communication system of claim 22, further comprising:

a conjugator for conjugating the demodulated half-symbols along the second signal path.

25. The communication system of claim 22, further comprising:

a combiner for combining the demodulated half-symbols received from the first and second signal paths of the respective first and second correlators.

26. The communication system of claim 25, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols along the first signal path of the first correlator and the second signal path of the second correlator; and

a second accumulator for accumulating the demodulated half-symbols along the second signal path of the first correlator and the first signal path of the second correlator.

27. A communication system, comprising:

a transmitter; and

a receiver for processing a received signal transmitted from the transmitter, said receiver including:

a first and second correlator, each correlator including

a decov element for decoving a plurality of received samples to provide decoved half-symbols, wherein the decov element is configured to perform decoving with a decoving channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples;

a switch for selectively outputting the decoved half-symbols corresponding to a first half of a symbol period along a first signal path and decoved half-symbols corresponding to a second half of the symbol period along a second signal path;

first and second summers, respectively coupled to the first and second signal paths, for combining each pair of decoved half-symbols to provide a respective decoved symbol; and

first and second multipliers for receiving the decoved symbols and pilot symbols to provide demodulated symbols.

28. The communication system of claim 27, wherein the received samples are despread received samples, said first and second correlator further including:

a third multiplier for producing the despread received samples.

29. The communication system of claim 27, further comprising:

a conjugator for conjugating the decoved symbols along the second signal path of the first correlator and the first signal path of the second correlator.

30. The communication system of claim 27, further comprising:

a delay element for delaying the decoved half-symbols along the first signal path.

31. The communication system of claim 27, further comprising:

a combiner for combining the demodulated symbols received from the first and second correlators.

32. The communication system of claim 31, wherein the combiner comprises:
  - a first accumulator for accumulating the demodulated symbols from the first multiplier of the first and second correlators; and
  - a second accumulator for accumulating the demodulated symbols from the second multiplier of the first and second correlators.
33. A method for processing a received signal in a wireless communication system, comprising:
  - decoupling a plurality of received samples to provide recovered half-symbols, wherein the decoupling is performed with a decoupling channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples; and
  - receiving the recovered half-symbols and pilot symbols to provide demodulated half-symbols by a multiplier.
34. The method of claim 33, further comprising:
  - despread the received samples.
35. The method of claim 33, further comprising:
  - combining the demodulated half-symbols received from the multiplier.
36. The method of claim 35, wherein said combining further comprises:
  - accumulating the demodulated half-symbols corresponding to a first half of a symbol period in a first accumulator; and
  - accumulating the demodulated half-symbols corresponding to a second half of the symbol period in a second accumulator.
37. The method of claim 33, further comprising:
  - selectively outputting the demodulated half-symbols corresponding to a first half of the symbol period and the demodulated half-symbols corresponding to a second half of the symbol period.